United States Department of Agriculture | Forest Service | Northeastern Area State & Private Forestry | 180 Canfield Street Morgantown, WV 26505-3101

File Code: 3411 (NA-12-02)
Date: July 5, 2012

Subject: Gall on honey locust

To: David Roscoe

As requested I have examined the sample of honey locust that I received on June 19. The plant appears to be suffering from a plant disease know as crown gall. The light color, spongy gall (tumor) is a distinctive symptom of this pathogen. Crown gall is caused by *Agrobacterium tumefaciens*, a common soil inhabiting bacterium that affects dicotyledonous (broad-leaved) plants. This is one of the most common plant pathogens and more than 600 species of plants are susceptible. Crown gall is found most often on stone fruit and pome trees as well as brambles and several species of ornamental plants (Collins, 2011). Crown gall does not typically kill a plant, but in young ornamentals their presence is usually cause enough to remove the plant.

Figure 1: Crown Gall collected June 19, 2012 at the general hospital Morgantown, WV.

Agrobacterium tumefaciens is spread by rain, irrigation water, tools, insects, and plant parts used for propagation. Crown gall enters through a wound or opening in the plant tissue and causes the plant to produce galls. The galls (Figure. 1 and 2) typically start below the soil line, but are most often seen on the stem and branches.

Figure2: Dissected Crown Gall collected June 19, 2012 at the general hospital Morgantown, WV.

Control

As with any plant disease, crown galls survival is a function of three factors, having an environment conducive to survival, the presence of the pathogen, and a host that is susceptible. In general bacterial diseases are difficult to control. But if any one of the three factors can be removed the disease can be controlled.

Environment

Soil in this area is conducive to the bacterium as long as there is a host plant, and the bacterium can live in the soil without a host plant for up to five years. It is very important that all mulch and nursery stock come from uninfected areas. If this bacterium gets into the soil at a nursery it will affect the whole nursery, any plant or dirt moved from an infected nursery can carry the bacterium. In order to sterilize the soil the host plant must be removed and the soil let rest for three to five years before a susceptible species is planted again.

Pathogen

The pathogen can be controlled by painting the galls with Gallex. Gallex is an oil based emulsion that contains several hydrocarbons that selectively penetrate and kill crown gall tissue (Figure 3). The down

fall of this product is it must be applied directly to the gall to work, so if there are galls in the crown of a large tree this would be a very complicated process. Another option is to use Galltrol. Galltrol can be applied to the roots to prevent the bacteria by forming antibiotics that are toxic to the gall producing pathogen; this prevents the gall from forming.

Figure 3: Gall eradicated with Gallex (AgBioChem, 2012).

Plant host

If the plant is showing symptoms of crown gall, it usually means the soil around the tree is infected with the pathogen. If a small ornamental tree gets the galls it is best to remove the tree and plant a resistant species (Table 1). If there is just one large tree infected and no other trees in the area that may be susceptible it may be best to leave the tree as is because the galls shouldn't kill the tree and it's very costly to replace a grown tree.

Here are some recommended cultural methods to control crown gall.

1. Avoid all unnecessary wounding

2. When grafting use sterilized tools

3. Inspect plants carefully when buying

4. Remove and burn infected plants

5. Plant resistant plants in infested areas (Table 1)

6. Painting galls with the chemical eradicant Gallex may be effective

7. Use the antagonistic bacterium Agrobacterium radiobacter (Galltrol) as a pre-planting preventative treatment

(Watt, 2004)

Table 1: Ornamentals resistant to Crown Gall (Hansen, 2009).

Amelanchier (serviceberry)
Betula (birch)
Carpinus (hornbeam)
Catalpa
Cedrus (cedar)
Cercis (redbud)
Cladrastis (yellowwood)
Cotinus (smoke tree)
Fagus (beech)
Gymnocladus (Kentucky coffee-tree) *Ilex* (holly)
Kalmia (mountain laurel)
Larix (larch)
Leucothoe
Liquidambar (sweet gum)
Liriodendron (tulip tree)
Magnolia
Mahonia (Oregon grape, holly grape)
Nyssa (sour gum)
Picea (spruce)
Rhus (sumac)
Sambucus (elderberry)
Sassafras
Tsuga (hemlock)

It would be helpful to visit the tree that this sample came from to look for galls around the soil line and see the size of the tree in order to make a better determination of whether or not this is crown gall. Please give me a call at 304-285-1562 to set up a time when we can come and examine the infected tree.

Sincerely,

Bryan Feicht

Biological Technician

Northeastern Area S&PF

180 Canfield St. Morgantown, WV 26505

bpfeicht@fs.fed.us

304-285-1562

Works Cited

AgBioChem. (2012). *Gallex.* Retrieved June 26, 2012, from AgBioChem, Inc. : http://agbiochem.com/GallEx.aspx

AgBioChem. (2012). *Galltrol.* Retrieved June 26, 2012, from AgBioChem, Inc.: http://agbiochem.com/Galltrol.aspx

Collins, A. (2011). *Agrobacterium tumefaciens* . Retrieved June 25, 2012, from NC State University: http://www.cals.ncsu.edu/course/pp728/Agrobacterium/Alyssa_Collins_profile.htm

Hansen, G. H. (2009, May 9). *Crown Gall of Woody Ornamentals.* Retrieved June 25, 2012, from Virginia Cooperative Extension: http://pubs.ext.vt.edu/450/450-608/450-608.html

Lyon, W. A. (2005). *Diseases of Trees and Shrubs Secound Edition.* Cornell University Press.

University of Missouri Extension. (2009, June 8). *Soil Testing and Plant Diagnostic Services.* Retrieved June 29, 2012, from University of Missouri Extension: http://soilplantlab.missouri.edu/plant/diseases/crowngall.aspx

Watt, B. A. (2004). *Pest Management Fact Sheet #5095.* Retrieved June 25, 2012, from The University of Maine Cooperative Extension: Insect Pests & Plant Diseases : http://umaine.edu/ipm/ipddl/publications/5095e/